APPENDIX V

Serial No.: 09/520,032

Docket No.: 49933US031

Continued Prosecution Application under 37 C.F.R. § 153(d) with Preliminary Amendment filed with the U. S. Patent and Trademark Office on August 23, 2001.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket Number	Anticipated (Anticipated Classification		
49933USA6H031	Class	Subclass	Examiner Joseph Leyson	Art Unit 1722

REQUEST FOR CONTINUED PROSECUTION APPLICATION
UNDER RULE 1.53(d)

Assistant Commissioner for Patents

ATTN: Box CPA

Washington, DC 20231

Sir:

This is a request for filing a continued prosecution application under 37 CFR §1.53(d) of prior application Serial No. 09/520,032, Confirmation No. Unknown, filed on 6 March 2000, entitled TOOLS TO MANUFACTURE ABRASIVE ARTICLES by the following inventor(s):

Timothy L. HOOPMAN

Residence:

City of River Falls, State of Wisconsin, U.S.A.

Citizenship:

United States of America

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P.O. Box 33427

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St. Paul, Minnesota 55133-3427

Nelson D. SEWALL

Residence:

City of Forest Lake, State of Minnesota, U.S.A.

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Address:

St. Paul, Minnesota 55133-3427

The above-identified prior application in which no payment of the issue fee, abandonment of, or termination of proceedings has occurred, is hereby expressly abandoned as of the filing date of this new application. Please use all the contents of the prior application file wrapper, including the drawings, as the basic papers for the new application.

1.		Enter the amendment previously filed on under 37 CFR §1.116 but unentered, in the prior application.
2.	<u>X</u>	Please cancel claims 1-16, 18, 22-24, 29-32, 88-93, 97, and 112-132.
3	<u>_x</u> _	A preliminary amendment is enclosed (the filing fee calculation includes any new claims).

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4. \underline{X} The filing fee is calculated below:

	and the special section of the secti	CLAIMS AS FILE	D: [2,	
NUMBER FILED		NUMBER EXTRA	RATE	BASIC FEE \$710
Total Claims	40-20 =	20	\$18	\$360
Independent Claims	38-3 =	35	\$80	\$2800
MULTIPLE DEPENDENT CLAIM PRESENTED			\$270	\$0
			FILING FEE:	\$3870

- 5. X The Commissioner is hereby authorized to charge any additional fees as set forth in 37 CFR §1.16 to 1.18 which may be required such as an extension of time in the parent application or credit any overpayment to Deposit Account No. 13-4895.
- 6. X Please charge Deposit Account No. 13-4895 in the amount of \$3870.
- 7. Priority of foreign application Serial No. ___, filed on ___ in (country) ____ is claimed under 35 U.S.C. §119.
- 8. _ This application is being filed by less than all of the inventors named in the prior application. Please delete the names of the following inventor(s) who are not inventors of the invention claimed in the present application:
- 9. X The prior application is assigned of record to 3M Innovative Properties Company.
- 10. \underline{X} The Power of Attorney in the prior application is to:

Attention: Gregory D. Allen
3M Innovative Properties Company
3M Office of Intellectual Property Counsel
P.O. Box 33427
St. Paul, MN 55133-3427

Applicant: HOOPMAN et al. Serial No.: 09/520,032 Filed: 6 March 2000

Title: TOOLS TO MANUFACTURE ABRASIVE ARTICLES

Address all future communications to: (may only be completed by the attorney or agent of record)

3M Innovative Properties Company 3M Office of Intellectual Property Counsel P.O. Box 33427 St. Paul, MN 55133-3427 Attn.: Gregory D. Allen

11. ___ A petition, fee, and response was filed to extend the term in the pending prior application until _

23 AUGUST 2001

Date

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Date of Deposit August 23, 2001

I hereby certify that this paper and/or fee is/are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, ATTN: Box CPA, Washington, D. C. 20231.

Name: Rachel Gagliardi-Grabau

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	HOOPMAN et al.)	Group Art Unit:	1722
Serial No.:	09/520,032)	Examiner:	J. Leyson
Confirmation	No.: Unknown)		
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Filed:	6 March 2000)		
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For:	TOOLS TO MANUFACTU	RE AB	RASIVE ARTICL	ES

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents

ATTN: BOX CPA

Washington, D.C. 20231

Dear Sir:

Prior to taking up the above-identified application for examination, please amend the application as follows:

In the Specification

Please replace the paragraph beginning at page 1, line 7, with the following rewritten paragraph. Per 37 C.F.R. §1.121, this paragraph is also shown in Appendix A with notations to indicate the changes made.

--This application is a division of Application No. 09/259,488 (filed February 26, 1999) issued as U.S. Patent No. 6,076,248, which application is a division of Application No. 08/940,267 (filed September 29, 1997) issued as U.S. Patent No. 6,129,540, which is a continuation of Application No. 08/450,814 (filed May 25, 1995), abandoned, which is a division of Application No. 08/120,300 (filed September 13, 1993), abandoned. --

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In the Claims

Please cancel claims 1-16, 18, 22-24, 29-32, 88-93, and 97 as requested in the Request for Continued Prosecution Application Under Rule §1.53(d), filed concurrently herewith. The amended claims are provided below in clean form. Per 37 C.F.R. §1.121, amended claims are also shown in Appendix A with notations to indicate changes made (for convenience, all pending claims, including those added hereby, are provided in Appendix A).

- 17. (AMENDED) The production tool of claim 16, wherein each said pyramidal shape comprises planar surfaces which intersect to form a material-included angle at a distal end of said pyramid, wherein said material-included angle is a value from 25° to 90°.
- 19. (AMENDED) A production tool useful to shape an abrasive slurry into an array of three-dimensional nonidentical abrasive composites, said production tool manufactured by a method comprising:
 - (A) preparing a master tool, the method comprising:
- (1) determining angles corresponding to facing right and left planar surfaces of adjacent three-dimensional shapes and wherein each of said angles has a value as measured between its planar surface and a plane which extends in a normal direction to said major surface and contains an edge of said planar surface in contact with said major surface, by the following substeps:
- (i) selecting an angle value between, but not including, 0° and 90° to establish a first right half angle of a first right planar surface of a first right-side three-dimensional shape with a random number generating means capable of randomly selecting an angle value between, but not including, 0° and 90°;
- (ii) selecting an angle value between, but not including, 0° and 90° with said random number generating means to establish a first left half angle for a first left planar surface of a first left-side three-dimensional-shape-facing-said-first-right-planar-surface of said first-right-side three-dimensional shape;

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(iii) proceeding along a first direction extending linearly within said first imaginary plane to a second left planar surface of a second left-side three-dimensional shape located adjacent said first left-side three-dimensional shape and using said random number generating means to select a value between, but not including, 0° and 90° to establish a second left planar angle for said second left planar surface;

- (iv) using said random number generating means to select a value between, but not including, 0° and 90° for a second right planar surface of a second right-side three-dimensional shape facing said second left planar surface;
- (v) proceeding along said first direction to a third right-side threedimensional shape located adjacent said second right-side three-dimensional shape;
- (vi) repeating said substeps (i), (ii), (iii), (iv), and (v), in that sequence, at least once;
- (2) repeating step (1) except that the angles are determined for left and right planar surfaces of adjacent three-dimensional shapes deployed in two adjacent rows in a second direction extending linearly within said first imaginary plane, wherein said first and second directions intersect;
- (3) using means to determine, for a given width of said surface of said master, locations of grooves required to be cut by a cutting means to form a series of intersecting grooves defining a plurality of three-dimensional shapes having said angles calculated by steps (1) and (2); and
- (4) providing a cutting means to cut grooves in said surface of said master in correspondence to said angles calculated by steps (1) and (2) and said groove locations determined by step (3) to form a series of intersecting grooves which define a plurality of three-dimensional shapes upraised from said surface, each of said shapes being defined by a distinct and discernible boundary including specific dimensions, wherein not all said three-dimensional shapes are identical; and
 - (B) forming a production tool using the master tool.
 - 20. (AMENDED) The production tool of claim 14 which is a roll.

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- 21. (AMENDED) A production tool for manufacturing an abrasive article that comprises a major surface having deployed in fixed position thereon first and second three-dimensional abrasive composites, each of said composites comprising abrasive particles dispersed in a binder and having a shape defined by a substantially distinct and discernible boundary which includes substantially specific dimensions, wherein said first abrasive composite has a shape having specific first dimensions and said second abrasive composite has a second shape having second specific dimensions, wherein each of said abrasive composites has a boundary defined by at least four planar surfaces wherein adjacent planar surfaces of one composite meet at an edge to define an angle of intersection therebetween, wherein at least one angle of intersection of said first abrasive composite is different from all of the angles of intersection of said second composite, said production tool comprising a structure having a plurality of adjacent three-dimensional cavities form on a major surface thereof, wherein each three-dimensional cavity is defined by a substantially distinct and discernible boundary which includes substantially specific dimensions. wherein a first three-dimensional cavity has a first shape having specific first dimensions and a second three-dimensional cavity has a second shape having second specific dimensions, wherein each of said three-dimensional cavities has a boundary defined by at least four planar surfaces wherein adjacent planar surfaces of one three-dimensional cavity meet at an edge to define an angle of intersection therebetween, wherein at least one angle of intersection of said first three-dimensional cavity is different from all angles of intersection of said second three-dimensional cavity, wherein the production tool is a coating roll.
- 33. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first and second plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape and the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second plurality of angles, wherein the production tool is a coating roll.

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34. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, and third plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape, the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, and the third plurality of cavities each have a third geometric shape and third plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second and third plurality of angles, and wherein at least one of the angles of the second plurality is different from all of the angles of the first and third plurality of angles, wherein the production tool is a coating roll.

35. AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, third, and fourth plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape, the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, the third plurality of cavities each have a third geometric shape and third plurality of angles forming the geometric shape, and the fourth plurality of cavities each have a fourth geometric shape and fourth plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second, third, and fourth plurality of angles, wherein at least one of the angles of the first, third, and fourth plurality of angles, and wherein at least one of the angles of the third plurality is different from all of the angles of the first, second, and fourth plurality of angles, wherein the production tool is a coating roll.

36. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 10% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is a coating roll.

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37. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 30% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is a coating roll.

38. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 50% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is a coating roll.

39. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have a geometric shape, dimensions defining the cavity, and angles forming the geometric shape, wherein the angles are different in at least two of the cavities, and further wherein at least 10% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is a coating roll.

40. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, and wherein at least two adjacent cavities have at least one dimension different between the two cavities, wherein the production tool is a coating roll.

41. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defining at least a first and a second group, wherein a first group of cavities has a first shape and a second group of cavities has a second, different, shape, wherein the production tool is a coating roll.

42. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defining at least a first and a second group, wherein a first group of

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cavities has a first size and a second group of cavities has a second, different, size, wherein the production tool is a coating roll.

- 43. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defined by substantially distinct and discernible boundaries which include substantially specific dimensions, wherein a first cavity has specific first dimensions and a second cavity has specific second dimensions, and further wherein each of said cavities has a boundary defined by at least four planar surfaces wherein adjacent planar surfaces of one cavity meet at an edge to define an angle of intersection therebetween, wherein at least one angle of intersection of said first cavity is different from all the angles of intersection of said second cavity, wherein the production tool is a coating roll.
- 44. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first and second plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape and the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second plurality of angles, wherein the production tool is an engraved metal roll.
- 45. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, and third plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape, the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, and the third plurality of cavities each have a third geometric shape and third plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second plurality is different from all of the angles of the first and third-plurality-of-angles, wherein the production tool is an engraved metal roll.

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- 46. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, third, and fourth plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and first plurality of angles forming the geometric shape, the second plurality of cavities each have a second geometric shape and second plurality of angles forming the geometric shape, the third plurality of cavities each have a third geometric shape and third plurality of angles forming the geometric shape, and the fourth plurality of cavities each have a fourth geometric shape and fourth plurality of angles forming the geometric shape, wherein at least one of the angles of the first plurality is different from all of the angles of the second, third, and fourth plurality of angles, wherein at least one of the angles of the first, third, and fourth plurality of angles, and wherein at least one of the angles of the third plurality is different from all of the angles of the first, second, and fourth plurality of angles, wherein the production tool is an engraved metal roll.
- 47. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 10% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is an engraved metal roll.
- 48. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 30% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is an engraved metal roll.
- 49. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, wherein at least 50% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is an engraved metal roll.

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50. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have a geometric shape, dimensions defining the cavity, and angles forming the geometric shape, wherein the angles are different in at least two of the cavities, and further wherein at least 10% of pairs of adjacent cavities have at least one dimension different between the two cavities of the pair, wherein the production tool is an engraved metal roll.

- 51. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, and wherein at least two adjacent cavities have at least one dimension different between the two cavities, wherein the production tool is an engraved metal roll.
- 52. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defining at least a first and a second group, wherein a first group of cavities has a first shape and a second group of cavities has a second, different, shape, wherein the production tool is an engraved metal roll.
- 53. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defining at least a first and a second group, wherein a first group of cavities has a first size and a second group of cavities has a second, different, size, wherein the production tool is an engraved metal roll.
- 54. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities defined by substantially distinct and discernible boundaries which include substantially specific dimensions, wherein a first cavity has specific first dimensions and a second-cavity has specific second-dimensions, and further-wherein each-of said-cavities has a boundary-defined by at least four planar surfaces wherein adjacent planar surfaces of one cavity meet at an edge

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to define an angle of intersection therebetween, wherein at least one angle of intersection of said first cavity is different from all the angles of intersection of said second cavity, wherein the production tool is an engraved metal roll.

- 98. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first and second plurality of cavities, wherein the first plurality of cavities each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape and the second plurality of cavities each have a second geometric shape including a base and second plurality of base edge lengths forming the base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second plurality of base edge lengths, production tool is a coating roll.
- 99. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, and third plurality of cavities, wherein the first plurality of cavities each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape, the second plurality of cavities each have a second geometric shape including a base and second plurality of base edge lengths forming the base of the geometric shape, and the third plurality of cavities each have a third geometric shape including a base and third plurality of base edge lengths forming the base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second and third plurality of base edge lengths, and wherein at least one of the base edge lengths of the second plurality is different from all of the base edge lengths of the first and third plurality of base edge lengths, production tool is a coating roll.
- 100. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, third, and fourth plurality of cavities, wherein the first plurality of cavities each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape, the second plurality of cavities each have a second geometric shape

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including a base and second plurality of base edge lengths forming the base of the geometric shape, the third plurality of cavities each have a third geometric shape including a base and third plurality of base edge lengths forming the base of the geometric shape, and the fourth plurality of cavities each have a fourth geometric shape including a base and fourth plurality of base edge lengths forming base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second, third, and fourth plurality of base edge lengths, wherein at least one of the base edge lengths of the second plurality is different from all of the base edge lengths of the first, third, and fourth plurality of base edge lengths, and wherein at least of the base edge lengths one of the third plurality is different from all of the base edge lengths of the first, second, and fourth plurality of base edge lengths, production tool is a coating roll.

- 101. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 10% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair, production tool is a coating roll.
- 102. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 30% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair, production tool is a coating roll.
- 103. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 50% of pairs of adjacent cavities have at least-one-base-edge-length-different-between-the-two-cavities-of-the-pair,-production-tool-is-a-coating-roll.

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104. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, and wherein at least two adjacent cavities have at least one base edge lengths different between the two cavities, production tool is a coating roll.

105. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first and second plurality of cavities, wherein the first plurality of cavities each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape and the second plurality of cavities each have a second geometric shape including a base and second plurality of base edge lengths forming the base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second plurality of base edge lengths, production tool is an engraved metal roll.

106. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a first, second, and third plurality of cavities, wherein the first plurality of cavities each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape, the second plurality of cavities each have a second geometric shape including a base and second plurality of base edge lengths forming the base of the geometric shape, and the third plurality of cavities each have a third geometric shape including a base and third plurality of base edge lengths forming the base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second and third plurality of base edge lengths, and wherein at least one of the base edge lengths of the second plurality is different from all of the base edge lengths of the first and third plurality of base edge lengths, production tool is an engraved metal roll.

107. (AMENDED) A production tool suitable for use-in-manufacturing an-abrasive-article—comprising a first, second, third, and fourth plurality of cavities, wherein the first plurality of cavities

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each have a first geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape, the second plurality of cavities each have a second geometric shape including a base and second plurality of base edge lengths forming the base of the geometric shape, the third plurality of cavities each have a third geometric shape including a base and third plurality of base edge lengths forming the base of the geometric shape, and the fourth plurality of cavities each have a fourth geometric shape including a base and fourth plurality of base edge lengths forming base of the geometric shape, wherein at least one of the base edge lengths of the first plurality is different from all of the base edge lengths of the second, third, and fourth plurality of base edge lengths, wherein at least one of the base edge lengths of the second plurality is different from all of the base edge lengths of the first, third, and fourth plurality of base edge lengths of the first, second, and fourth plurality of base edge lengths, production tool is an engraved metal roll.

108. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 10% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair, production tool is an engraved metal roll.

109. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 30% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair, production tool is an engraved metal roll.

110. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 50% of pairs of adjacent cavities have at

least one base edge length different between the two cavities of the pair, production tool is an engraved metal roll.

111. (AMENDED) A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, and wherein at least two adjacent cavities have at least one base edge lengths different between the two cavities, production tool is an engraved metal roll.

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Remarks

Please enter and consider the amendments to the specification and amended claims 17, 19-21, 25-28, 33-54, and 98-111.

Response to Restriction Requirement

Applicants' elect, with traverse, the claims of Group II (claims 14-54 and 88-111).

Applicants reserve the right to pursue examination of the non-elected claims in continuation or divisional applications.

Applicants have cancelled the claims of Group I, and respectfully request reconsideration and withdrawal or modification of the restriction requirement. It is respectfully submitted that the inventions of Groups II (production tool) and III (method of making production tool) as claimed can be readily evaluated in one search without placing undue burden on the Examiner. That is, all the claims are so interrelated that a search of one group of claims will reveal art to the others.

The 35 U.S.C. §112, Second Paragraph, Rejections

Claims 16, 17, and 19-21 were rejection under 35 U.S.C. §112, second paragraph, as being indefinite. These claims have each been amended as suggested by the Examiner, thereby rendering each of the rejections moot.

The 35 U.S.C. §102(e) Rejections

Claims 14-16, 18, 22-24, 29-32, 88-93, and 97 were rejected under 35 U.S.C. §102(e) as being anticipated by Calhoun (U.S. Pat. No. 5,437,754). These claims have been cancelled in the interest of expediting prosecution. Applicants do not necessarily agree with the Examiner and reserve the right to pursue examination in a continuing application.

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The 35 U.S.C. §103 Rejections

The Examiner rejected claims 17, 25-28, and 94-96 under 35 U.S.C. §103(a) as being unpatentable over Calhoun (U.S. Patent No. 5,437,754). The Examiner also rejected claims 20, 33-35, 40-46, 51-54, 98-100, 104-107, and 111 under 35 U.S.C. §103(a) as being unpatentable over Calhoun (U.S. Patent No. 5,437,754) in view of Pieper et al. (U.S. Patent No. 5,152,917). The Examiner further rejected claims 36-39, 47-50, 101-103, and 108-110 under 35 U.S.C. §103(a) as being unpatentable over Calhoun (U.S. Patent No. 5,437,754) as applied to claims 17, 25-28, and 94-96 above, and further in view of Pieper et al. (U.S. Patent No. 5,152,917).

The present application was filed on 6 March 2000 and a Continued Prosecution Application (CPA) is filed herewith. At the time of the invention of the instant application was made, the claimed invention, Calhoun (5,437,754), and Pieper et al. (5,152,917) were owned by or subject to an obligation of assignment to the same entity.

Applicants respectfully request that the rejection under 35 U.S.C. 103 be withdrawn, and notification to that effect is requested.

Obviousness Type Double Patenting Rejections

The Examiner rejected claims 19 and 21 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15 and 16 of U.S. Patent No. 6,129,540 (Hoopman et al.). Submitted herewith is a Terminal Disclaimer with respect to 6,129,540 (Hoopman et al.). Also submitted herewith please find copies of Assignments for the present application. Applicant submits that the Terminal Disclaimer is in compliance with 37 C.F.R. 1.321(c).

Applicants respectfully request that the double patenting rejection be considered moot, and that the rejection be withdrawn.

Serial No.: 09/520,032 Filed: 6 March 2001

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Conclusion

The Examiner is invited to contact Applicants' Representatives at the below-listed telephone number, if there are any questions regarding this Preliminary Amendment or if prosecution of this application may be assisted thereby.

Respectfully submitted for

HOOPMAN et al.

Ву

Mueting, Raasch & Gebhardt, P.A.

Page 17 of 17

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23 AUGUST 2001

Date

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Date of Deposit August 23, 2001

I hereby certify that this paper and/or fee is/are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Assistant Copamissioner for Patents, ATTN: Box CPA, Washington, D. C. 20231.

Name: Rachel Gagliardi-Grabau

APPENDIX A - SPECIFICATION/CLAIM AMENDMENTS INCLUDING NOTATIONS TO INDICATE CHANGES MADE

Serial No.: 09/520,032 Docket No.: 49933USA6H.031

Amendments to the following are indicated by underlining what has been added and bracketing what has been deleted. Additionally, all amendments have been shaded.

In the Specification

The paragraph beginning at page 1, line 7, has been amended as follows:

This application is a division of Application No. 09/259,488 (filed February 26, 1999) (1995) (1996) (1996) (1996) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997) (1997)

In the Claims

For convenience, all pending claims are shown below.

- 1. 16. (CANCELLED)
- 17. (AMENDED) The production tool of claim 16, wherein each said pyramidal shape comprises planar surfaces which intersect to form a material-included angle at a distal end of said pyramid, wherein said material-included angle is a value from 25° and 25° 20°.

18. (CANCELLED)

19. (AMENDED) A production tool useful to shape an abrasive slurry into an array of three-dimensional nonidentical abrasive composites, said production tool manufactured manufactured manufactured tool being manufactured by a method comprising the steps of:

values preparing a master tools the method comprising

(1) determining angles corresponding to facing right and left planar surfaces of adjacent three-dimensional shapes and wherein each of said angles has a value as measured between

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its planar surface and a plane which extends in a normal direction to said major surface and contains an edge of said planar surface in contact with said major surface, by the following substeps:

- (i) selecting an angle value between, but not including, 0° and 90° to establish a first right half angle of a first right planar surface of a first right-side three-dimensional shape with a random number generating means capable of randomly selecting an angle value between, but not including, 0° and 90°;
- (ii) selecting an angle value between, but not including, 0° and 90° with said random number generating means to establish a first left half angle for a first left planar surface of a first left-side three-dimensional shape facing said first right planar surface of said first right-side three-dimensional shape;
- (iii) proceeding along a first direction extending linearly within said first imaginary plane to a second left planar surface of a second left-side three-dimensional shape located adjacent said first left-side three-dimensional shape and using said random number generating means to select a value between, but not including, 0° and 90° to establish a second left planar angle for said second left planar surface;
- (iv) using said random number generating means to select a value between, but not including, 0° and 90° for a second right planar surface of a second right-side threedimensional shape facing said second left planar surface;
- (v) proceeding along said first direction to a third right-side threedimensional shape located adjacent said second right-side three-dimensional shape;
- (vi) repeating said substeps (i), (ii), (iii), (iv), and (v), in that sequence, at least once;
 - (2) repeating step (1) except that the angles are determined for left and right planar surfaces of adjacent three-dimensional shapes deployed in two adjacent rows in a second direction extending linearly within said first imaginary plane, wherein said first and

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- (3) using means to determine, for a given width of said surface of said master, locations of grooves required to be cut by a cutting means to form a series of intersecting grooves defining a plurality of three-dimensional shapes having said angles calculated by steps (1) and (2); and
- (4) providing a cutting means to cut grooves in said surface of said master in correspondence to said angles calculated by steps (1) and (2) and said groove locations determined by step (3) to form a series of intersecting grooves which define a plurality of three-dimensional shapes upraised from said surface, each of said shapes being defined by a distinct and discernible boundary including specific dimensions, wherein not all said three-dimensional shapes are identical;

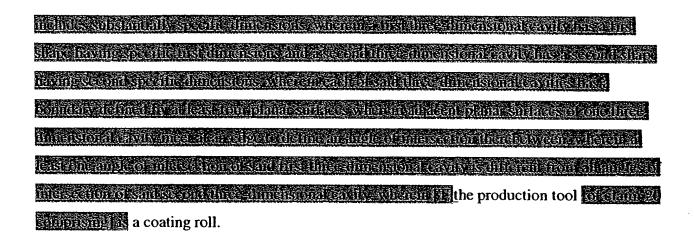
(Big. forming apportunition to dissing the masterion).

20. (AMENDED) The production tool of claim 14 computing whiches a roll.

21. (AMENDED) Viscolitoriolocolocatemplacing an abasis estidistinal complises a major mixed by the physical periodic dependent of the special and the complishes. Historia major management of the special periodic dependent of the special dependent

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22. - 32. (CANCELLED)

33. (AMENDED) IDE PRODUCTION SOLD AND CONTROL OF A PROCESSION AND CONTROL OF A PROCESS

34. (AMENDED) The production took of claim 231/A production took small case use improved the production took of claim 231/A production took small case uses use improved this second, and third plurality of cavities. Wherein the first plurality of cavities each have a first geometric shape and insteplurality of angles forming the geometric shape unless conditionably of cavities each have a second geometric shape and the third plurality of cavities and the third plurality of cavities each have a third geometric shape and third plurality of angles forming the geometric shape wherein a layer a third geometric shape and third plurality of angles forming the geometric shape wherein a

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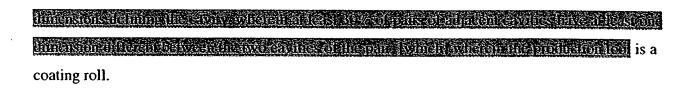
ie is one of the angle. Of the bis opination is unificated from all to the energy of the second and thing shows a fundamental decreasing a leader angle. Of the second pluratory is different from all static angles of the answer and third pluratory is a coating roll.

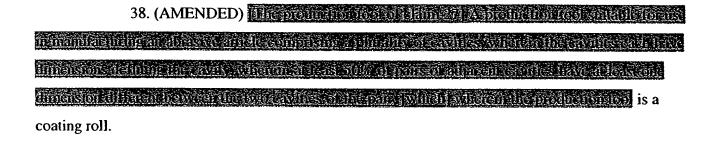
35. (AMENDED) The prediction constitution and touch parallely of a con

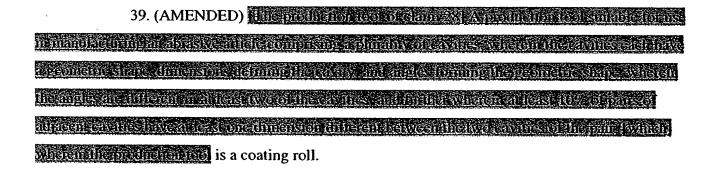
36. (AMENDED) The production took of claim 25. A production took smalled to use instrumental actions and the compassing a planature of caviness where or the coveres each that dimension distanting the cavity wherem at least 10% of pairs of adjacent cavines have all that one dimension different between the two cavines of the pair (which) wherein the production took is a coating roll.

37. (AMENDED) The production tool of claim 261 A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the eavities each have

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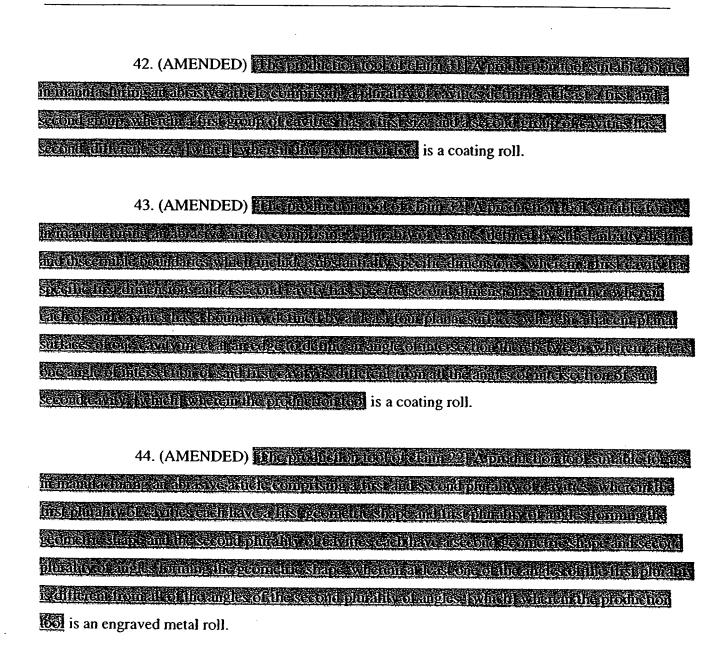
- 40. (AMENDED) The production to the 29 FA production tool smaller manss
 in manufactuains and between the compassing a physical volcavines wherein the cavines call the volcavines wherein the cavity and wherein a less two adjacent cavities have a less one dimension therefore the third wherein the production less is a coating roll.
- 41. (AMENDED) The production tool of claim 30 Aproduction tool suitable ton use increasing approach of claim 30 Aproduction tool suitable ton use increasing approach to the production tool is a coating roll.

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45. (AMENDED) The production tool of claim 23. As production tool suitable for use in manufacturing an abrasive article comprising a first second, and third plurality of cavities, wherein the first plurality of cavities each have a first geometric shape and this t plurality of angles forming the

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geometric spape the secondiplorance reacting sealing reaction geometric shape and second plinance of an experimental second plinance of an experimental second plinance of the sealing space of the se

46. (AMENDED) The prediction of claims (Paper Britanian Resident) is an engraved metal roll.

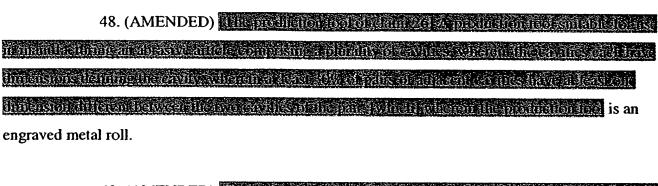
47. (AMENDED) Line production tool of Glaim 25. As production tool suitable for use incinanulae turing an abrasive article compasing a plurably of cavines wherein the cavines each have dimensions de limit the cavity wherein a dease 10% of pairs of adjacent cavines have at least one dimension of the rentibetween the two cavities of the pair. [which wherein the production tool is an

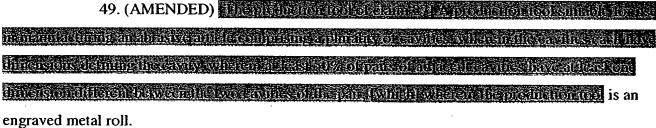
Page A-9

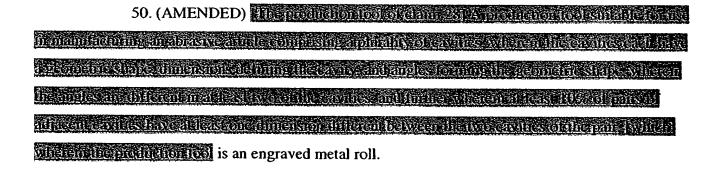
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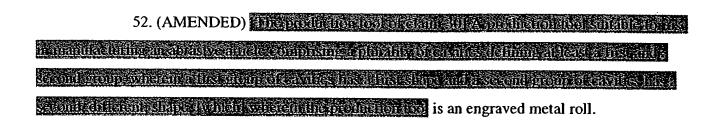


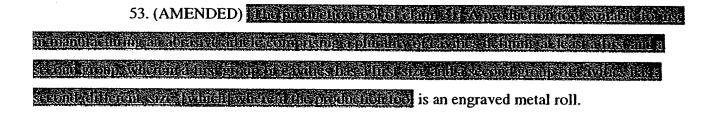
51. (AMENDED) The production tooks team 29 Approduction tooks made in the interest tooks made in the cavities call that in the manufacturing appropriately observates where nother earning call that dimensions defining the cavity and wherein at least two adjacents while they call east one dimension is an engraved metal roll.

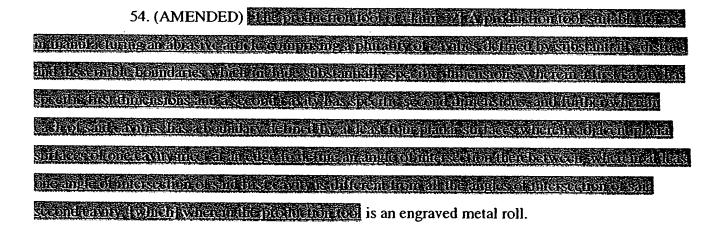
Preliminary Amendment - Appendix A

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55. - 93. (CANCELLED)

94. A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 10% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair.

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- 95. A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 30% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair.
- 96. A production tool suitable for use in manufacturing an abrasive article comprising a plurality of cavities, wherein the cavities each have dimensions defining the cavity, the dimensions including base edge lengths, wherein at least 50% of pairs of adjacent cavities have at least one base edge length different between the two cavities of the pair.

97. (CANCELLED)

98. (AMENDED) The prediction of the land of the prediction tool standing of the prediction tool standing of the prediction of the predicti

99. (AMENDED) The production to the Lamb 21. Action to the solitable for use in manufacturing an abeauty actual comprising abuse second and third plurality of axtics. Whatein the first plurality of cavines cach have at use geometric shape including a base and first plurality of base edge lengths forming the base of the geometric shape the second plurality of cavines each have accordage one the shape including a base and second plurality of base edge.

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100. (AMENDED) Enginetic is compressed and a sound that and to adjutants of the production of the prod

101. (AMENDED) The production to detain 94 A production to design the production to design applicability of cavilies wherein the cavilies can have dimensions defining the cavily, the dimensions including base edge lengths wherein at least

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103. (AMENDED) Une protection took of claims of Appendic to the smiles cavines and assume the control of the comprising a plinality of cavines while cavines and averdoness considerable the caviny the dimensions medical bull assemble to the caviny the dimensions medical bull assemble to the caviny the dimensions medical bull assemble to the caviny the dimensions and medical bull assemble to the caving the caving the caving the dimensions and the caving the ca

104. (AMENDED) The production tool of the American code of the cavity ending to a sequential decrease and the cavity ending the cavity the Atimers for microther parties and the cavity and all as well as a coding to be a coding to b

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108. (AMENDED) Enconstitute the official A Paprodiction to be the formulation of the content of

109. (AMENDED) The presumon of the same 97 PA productions consumable to use homeophogona abrasive article compassing appointing of caseings whereupone caving text have three using degrading the caving the dimensions including base (all elements wherein a best go of pairs of adjacent cavities have all least one base edge length different between the two cavings of the same pair (which production to) is an engraved metal roll.

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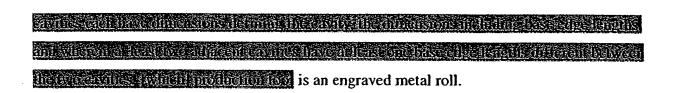
111. (AMENDED) [The production tool of claim 42 gas parallel in the for use in manufacturing an abrasive article comprising a plurality by cavines swherein the

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112. - 132. (CANCELLED)

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